CLAIMS:

1. A temperature control system for a bathing unit, the bathing unit including a receptacle for holding water and a heating module for heating the water supplied to the receptacle, said temperature control system comprising:

   a) a plurality of actuators associated to the heating module, said plurality of actuators being adapted for acquiring:

      i) a first set of actuation patterns causing the heating module to be in a non-heating state, said first set of actuation patterns including at least two configurations;

      ii) a second set of actuation patterns causing the heating module to be in a heating state, said second set of actuation patterns including at least one configuration;

   b) a temperature regulation device in communication with the plurality of actuators, said temperature regulation device operative for controlling said plurality of actuators such as to cause the heating module to be in either one of the heating state or the non-heating state, said temperature regulation device being adapted to select a configuration from the first set of actuation patterns for causing the heating module to be in the non-heating state.

2. A temperature control system as defined in claim 1, wherein said temperature regulation device is further operative for:

   a) receiving a signal indicative of a water temperature; and

   b) processing the signal indicative of the water temperature on the basis of a desired water temperature to derive a control signal;

   c) controlling said plurality of actuators on the basis of said control signal such as to cause the heating module to acquire either one of the heating state or the non-heating state.

3. A temperature control system as defined in claim 2, wherein said desired water temperature is provided by a bather.

4. A temperature control system as defined in claim 1, wherein the plurality of actuators are connected in series.

5. A temperature control system as defined in claim 1, wherein said temperature regulation device is operative for selecting a configuration from the first set of actuation patterns on the basis of a pattern.

6. A temperature control system as defined in claim 5, wherein said pattern is a random pattern.

7. A temperature control system as defined in claim 1, wherein said first set of actuation patterns includes two configurations, said temperature regulation device being operative for selecting between said two configurations in an alternating manner.

8. A temperature control system as defined in claim 1, wherein said temperature regulation device is operative for selecting a configuration from said first set of actuation pattern for causing the heating module to acquire a non-heating state by activating at least one actuator contained in said plurality of actuators.

9. A temperature control system as defined in claim 8, wherein activating at least one actuator contained in said plurality of actuators includes opening the at least one actuator.

10. A temperature control system as defined in claim 9, wherein deactivating at least one actuator contained in said plurality of actuators causes the at least one actuator to close.

11. A temperature control system as defined in claim 10, wherein deactivating the actuators in said plurality of actuators causes the heating module to be in a heating state.

12. A temperature control system as defined in claim 1, wherein said temperature regulation device is operative for selecting a configuration from the first set of actuation pattern for causing the heating module to acquire a non-heating state by deactivating at least one actuator contained in said plurality of actuators.

13. A temperature control system as defined in claim 12, wherein deactivating at least one actuator contained in said plurality of actuators includes opening the at least one actuator.

14. A temperature control system as defined in claim 13, wherein activating at least one actuator contained in said plurality of actuators causes the at least one actuator to close.

15. A temperature control system as defined in claim 14, wherein activating the actuators in said plurality of actuators causes the heating module to be in a heating state.

16. A temperature control system as defined in claim 1, wherein said temperature control system comprises:

a) an additional actuator distinct from said plurality of actuators;

b) a safety temperature regulation device responsive to an unsafe condition event for controlling said additional actuator for causing the heating module to acquire the non-heating state.

17. A temperature control system as defined in claim 16, wherein said unsafe condition event includes the temperature of the water exceeding a certain level.

18. A temperature control system as defined in claim 1, further comprising:

a) a capacitive water level sensor adapted for obtaining a capacitance measurement associated to a level of water in the heating module;

b) said temperature regulation device being in communication with said capacitive water level sensor for:

i) processing the capacitance measurement in order to derive a second control signal;

ii) controlling said plurality of actuators on the basis of said second control signal such as to cause the heating module to acquire either one of the heating state or the non-heating state.

19. A temperature control system as defined in claim 18, wherein said capacitive water level sensor is adapted to acquire a plurality of capacitance measurements, the capacitance measurements corresponding to levels of water in a range of levels of water.

20. A method for controlling the water temperature of a bathing unit, the bathing unit including a receptacle for holding the water, a heating module for heating the water supplied to the receptacle, and a plurality of actuators associated to the heating module, the plurality of actuators being adapted for acquiring:

a) a first set of actuation patterns causing the heating module to be in a non-heating state, said first set of actuation patterns including at least two configurations;

b) a second set of actuation patterns causing the heating module to be in a heating state, said second set of actuation patterns including at least one configuration;

said method comprising:

a) receiving a signal indicative of a water temperature;

b) processing the signal indicative of a water temperature on the basis of a desired water temperature to derive a control signal;

c) controlling said plurality of actuators such as to cause the heating module to acquire either one of a heating state or a non-heating state on the basis of said control signal;

d) selecting a configuration from the first set of actuation patterns when said control signal is indicative that the heating module should acquire the non-heating state.

21. A method as defined in claim 20, wherein said desired water temperature is provided by a bather.

22. A method as defined in claim 20, wherein the plurality of actuators are connected in series.

23. A method as defined in claim 20, further comprising selecting a configuration from the first set of actuation patterns on the basis of a pattern.

24. A method as defined in claim 23, wherein said pattern is a random pattern.

25. A method as defined in claim 20, wherein the first set of actuation patterns includes two configurations, said method comprising selecting between said two configurations in an alternating manner.

26. A method as defined in claim 20, wherein said method further comprises selecting a configuration from said first set of actuation pattern for causing the heating module to acquire a non-heating state by activating at least one actuator contained in the plurality of actuators.

27. A method as defined in claim 26, wherein activating at least one actuator contained in the plurality of actuators includes opening the at least one actuator.

28. A method as defined in claim 27, wherein deactivating at least one actuator contained in the plurality of actuators causes the at least one actuator to close.

29. A method as defined in claim 28, wherein deactivating the actuators in the plurality of actuators causes the heating module to be in a heating state.

30. A method as defined in claim 20, wherein said method further comprises selecting a configuration from the first set of actuation pattern for causing the heating module to acquire a non-heating state by deactivating at least one actuator contained in said plurality of actuators.

31. A method as defined in claim 30, wherein deactivating at least one actuator contained in said plurality of actuators includes opening the at least one actuator.

32. A method as defined in claim 31, wherein activating at least one actuator contained in said plurality of actuators causes the at least one actuator to close.

33. A method as defined in claim 32, wherein activating the actuators in said plurality of actuators causes the heating module to be in a heating state.

34. A method as defined in claim 20, wherein the method further comprises:

a) processing a capacitance measurement taken by a capacitive water level sensor in communication with the heating module in order to derive a second control signal;

b) controlling the plurality of actuators on the basis of said second control signal such as to cause the heating module to acquire either one of the heating state or the non-heating state.

35. A method as defined in claim 34, wherein the capacitive water level sensor is adapted to acquire a plurality of capacitance measurements, the capacitance measurements corresponding to levels of water in a range of levels of water.

36. A method for controlling heating of water in a bathing unit, the bathing unit including a receptacle for holding water, a heating module for heating the water supplied to the receptacle and a pump for circulating the water between the receptacle and the heating module, said method comprising:

a) intermittently causing activation of the pump to cause water to circulate between the receptacle and the heating module, an activation of the pump occurring after a certain delay time after a deactivation of the pump;

b) modifying the certain delay time at least in part on the basis of temperature measurements of the water taken between successive activations of the pump.

37. A method as defined in claim 36, wherein the pump remains active during a certain time interval following an activation of the pump, the method including causing said heating module to be in a heating state during at least a portion of the certain time interval.

38. A method as defined in claim 37, wherein said method includes causing a deactivation of the pump when a temperature measurement of the water exceeds a desired temperature.

39. A method as defined in claim 38, wherein said desired temperature is provided by a bather.

40. A method as defined in claim 36, wherein said method includes modifying the certain time delay at least in part on the basis of the rate of change of the water temperature measurements taken during a deactivation of the pump.

41. A method as defined in claim 40, wherein said method further involves deriving the rate of the temperature decrease from a first temperature measurement to a second temperature measurement.

42. A method as defined in claim 36, wherein said method includes activating the pump prior to the expiry of the certain delay time in response to a certain ambient air temperature measurement.

43. A temperature control system for a bathing unit, the bathing unit including a receptacle for holding water, a heating module for heating the water supplied to the receptacle and a pump for circulating water between the receptacle and the heating module, said temperature control system comprising:

a) a temperature sensor for measuring the temperature of the water;

b) a temperature regulation device in communication with said temperature sensor, said temperature regulation device being operative for:

i) intermittently causing activation of the pump to cause water to circulate between the receptacle and the heating module, an activation of

the pump occurring after a certain delay time after a deactivation of the pump;

ii) modifying the certain delay time at least in part on the basis of temperature measurements of the water taken between successive activations of the pump.

44. A temperature control system as defined in claim 43, wherein the pump remains active during a certain time interval following an activation of the pump, said temperature regulation device being operative for causing the heating module to be in a heating state during at least a portion of the certain time interval.

45. A temperature control system as defined in claim 43, wherein said temperature regulation device is operative for causing a deactivation of the pump when a temperature measurement of the water exceeds a desired temperature.

46. A temperature control system as defined in claim 45, wherein said desired temperature is provided by a bather.

47. A temperature control system as defined in claim 43, wherein said temperature regulation device is operative for modifying the certain time delay at least in part on the basis of the rate of change of water temperature measurements taken during a deactivation of the pump.

48. A temperature control system as defined in claim 47, wherein said temperature regulation device is operative for deriving the rate of the temperature decrease from a first temperature measurement to a second temperature measurement.

49. A temperature control system as defined in claim 43, wherein the pump is activated prior to the expiry of the certain delay time in response to a certain ambient air temperature measurement.

50. A method for controlling the heating of water in a bathing unit, the bathing unit including a receptacle for holding water, a heating module for heating the water

supplied to the receptacle and a pump for circulating the water between the receptacle and the heating module, said method comprising:

a) intermittently causing activation of the pump to cause water to circulate between the receptacle and the heating module, an activation of the pump occurring after a certain delay time after a deactivation of the pump;

b) modifying the certain delay time at least in part on the basis of an ambient air temperature measurement.

51. A method as defined in claim 50, wherein said ambient air temperature measurement is indicative of the temperature of the air.

52. A method as defined in claim 50, wherein said ambient air temperature measurement is indicative of a rate of change of air temperature.

53. A method as defined in claim 50, wherein the pump remains active during a certain time interval following an activation of the pump, the method including causing said heating module to be in a heating state during at least a portion of the certain time interval.

54. A method as defined in claim 53, wherein said method includes causing a deactivation of the pump when a temperature measurement of the water exceeds a desired temperature.

55. A method as defined in claim 54, wherein said desired temperature is provided by a bather.

56. A temperature control system for a bathing unit, the bathing unit including a receptacle for holding water, said temperature control system comprising:

a) a circulation system through which water can flow, said circulation system comprising:

i) a heating module for heating water; and

ii) circulation piping connecting said heating module to the receptacle for allowing water to be exchanged between the heating module and the receptacle;

b) a solid state device operative for controlling the power supplied to said heating module, said solid state device positioned in a thermally conductive relationship with the water in said circulation system such as to allow heat to dissipate from said solid state device to water in said circulation system.

57. A temperature control system as defined in claim 56, wherein said heating module includes:

c) an outer surface;

d) an inner surface defining a passage through which water can flow, said inner surface adapted for being in contact with the water passing through said passage; and

e) a conductive portion that extends from said inner surface to said outer surface;

f) said solid state device being mounted in contact with said conductive portion of said heating module such that said solid state device is in a thermally conductive relationship therewith.

58. A temperature control system as defined in claim 56, wherein said solid state device is mounted in contact with a thermally conductive portion of said circulation piping such that said solid state device is in a thermally conductive relationship therewith.

59. A temperature control system as defined in claim 56, wherein said solid state device includes a device selected from the set consisting of TRIACs, SRCs, FETs, IGBTs, MOSFETs, JFETs and BJTs (bipolar junction transistors).

60. A temperature control system as defined in claim 56, wherein said solid state device includes a TRIAC.

61. A temperature control system as defined in claim 56, wherein said solid state device is maintained in said thermally conductive relationship with said circulation system via a fastener.

62. A temperature control system as defined in claim 61, wherein the fastener includes an element selected from the set consisting of an adhesive and a mechanical fastener.

63. A temperature control system for a bathing unit, the bathing unit including a receptacle for holding water and a heating module for heating the water of the receptacle, said temperature control system comprising:

a) at least one solid state device associated to the heating module, said solid state device being adapted for supplying power to the heating module;

b) a temperature regulation device in communication with said solid state device, said temperature regulation device being operative for controlling said solid state device such as to regulate the amount of power supplied to said heating module.

64. A temperature control system as defined in claim 63, wherein said solid state device includes a device selected from the set consisting of TRIACs, SCRs. FETs, IGBTs, MOSFETs, JFETs and BJTs (bipolar junction transistors).

65. A temperature control system as defined in claim 63, wherein said temperature regulation device is operative to control said solid state device such that said solid state device causes the heating module to be used at a fraction of its capacity.

66. A temperature control system as defined in claim 63, wherein said temperature regulation device is operative for controlling the solid state device for reducing the amount of current supplied to the heating module.

67. A temperature control system as defined in claim 63, wherein said temperature regulation device is operative for reducing the amount of current supplied to the

heating module upon detection of the operation of one or more additional components associated to the bathing unit.